**GMP252 Carbon Dioxide Probe**

for ppm-Level Measurements

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**Features**

- Measurement range 0 ... 10 000 ppmCO₂
- Intelligent, stand-alone probe with analog and digital outputs
- Compatible with Indigo 200 transmitters and Vaisala Insight
- Wide operating temperature range -40 ... +60 °C
- IP65-classified housing
- 2nd-gen proprietary CARBOCAP® technology
- Full temperature and pressure compensations
- Integrated temperature measurement for CO₂ compensation purposes
- Compensations for background gases, O₂, and humidity
- Sensor head heated to prevent condensation

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**Benefits**

- Superior long-term stability
- Reliable and accurate
- Calibration certificate included

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Vaisala CARBOCAP® Carbon Dioxide Probe GMP252 is a new intelligent probe for measuring carbon dioxide. This robust, stand-alone measurement device is designed for use in agriculture, refrigeration, greenhouses and demanding HVAC applications.

GMP252 is suitable for harsh and humid CO₂ measurement environments where stable and accurate ppm-level CO₂ measurements are needed. GMP252 is based on Vaisala’s unique, second-generation CARBOCAP technology that enables exceptional stability. A new type of infrared (IR) light source is used instead of the traditional incandescent light bulb, which extends the lifetime of GMP252.

GMP252 incorporates an internal temperature sensor for compensation of the CO₂ measurement according to ambient temperature. The effects of pressure and background gas can also be compensated for. The measurement range is 0 ... 10 000 ppmCO₂ (measurements up to 30 000 ppmCO₂ are available with reduced accuracy). The operating temperature range of the probe is wide (-40 ... +60 °C (-40 ... +140 °F)), and the probe housing is classified as IP65. Condensation is prevented as the internal sensor head is heated.

GMP252 is resistant to dust and most chemicals, such as, H₂O₂ and alcohol-based cleaning agents.

**Ease of Use**

GMP252 is a compact probe with easy and fast plug-in, plug-out installation. The surface of the probe is smooth, which makes it easy to clean. The probe provides several output options, including analog current and voltage outputs and digital RS-485 output with Modbus protocol.

GMP252 can be connected to Indigo 200 series transmitters for an extended selection of outputs and configuration options. See [www.vaisala.com/indigo](http://www.vaisala.com/indigo).

For easy-to-use access to field calibration, device analytics, and configuration functionality, the probe can be connected to Vaisala Insight PC Software (for Windows® 7, 8.1 and 10: see [www.vaisala.com/insight](http://www.vaisala.com/insight)).

**Applications**

GMP252 is ideal for agriculture, refrigeration, greenhouses and demanding HVAC applications where stable and accurate ppm-level CO₂ measurements are needed.
Technical Data

Measurement Performance

Measurement range
- 0 ... 10 000 ppmCO₂ (up to 30 000 ppmCO₂ with reduced accuracy)

Accuracy at 25 °C and 1013 hPa (incl. Repeatability and Non-Linearity)
- 0 ... 3000 ppmCO₂ ±40 ppmCO₂
- 3000 ... 10 000 ppmCO₂ ±2 % of reading
- Up to 30 000 ppmCO₂ ±3.5 % of reading

Calibration Uncertainty
- at 2000 ppmCO₂ ±38 ppmCO₂
- at 10 000 ppmCO₂ ±105 ppmCO₂

Long-Term Stability
- 0 ... 3000 ppmCO₂ ±60 ppmCO₂/year
- 3000 ... 6000 ppmCO₂ ±150 ppmCO₂/year
- 6000 ... 10 000 ppmCO₂ ±300 ppmCO₂/year

Temperature Dependence 0 ... 10 000 ppmCO₂
- with compensation, -10 ... +50 °C ±0.05 % of reading/°C
- with compensation, -40 ... +60 °C < ±0.1 % of reading/°C
- without temperature compensation at 2000 ppmCO₂ (typical) -0.5 % of reading/°C

Pressure Dependence
- with compensation at 0 ... 10 000 ppmCO₂, 500 ... 1100 hPa ±0.015 % of reading/hPa
- without compensation (typical) ±0.15 % of reading/hPa

Humidity Dependence
- with compensation, 0 ... 10 000 ppmCO₂, 0 ... 100 %RH ±0.7 % of reading (at 25 °C (77 °F))
- without compensation (typical) ±0.05 % of reading/%RH

O₂ Dependence
- with compensation, 0 ... 10 000 ppm CO₂, 0 ... 90 %O₂ ±0.6 % of reading (at 25 °C (77 °F))
- without compensation (typical) -0.08 % of reading/%O₂

Start-Up, Warm-Up and Response Time
- Start-up time at 25 °C < 12 s
- Warm-up time for full spec. < 2 min
- Response time (T90) with standard filter < 1 min
- Response time (T90) with spray shield < 3 min

Flow-Through Option
- Response time (T90) with > 0.1 l/min 30 s
- Flow rate dependence < 1 l/min flow no effect
- Flow rate dependence 1 ... 10 l/min flow < 0.6% of reading l/min
- Gas flow operating range < 10 l/min
- Gas flow recommended range 0.1 ... 0.8 l/min

Operating Environment

Operating temperature of CO₂ measurement -40 ... +60 °C (-40 ... +140 °F)
Storage temperature -40 ... +70 °C (-40 ... +158 °F)
Humidity 0 ... 100 %RH, non-condensing
Condensation prevention Sensor head heating when power on
EMC compliance EN61326-1, Generic Environment
Chemical tolerance (temporary exposure during cleaning) • H₂O₂ (2000 ppm, non-condensing)
• Alcohol-based cleaning agents (for example ethanol and IPA)
• Acetone
• Acetic acid

Pressure
Compensated 500 ... 1100 hPa
Operating < 1.5 bar

Mechanical Specifications

Weight, probe 58 g (2.05 oz)
Connector type M12 5-pin male
IP rating, probe body IP65

Materials
Probe housing material PBT plastic
Filter PTFE
Connector Nickel plated brass

Dimensions
Probe diameter 25 mm (0.98 in)
Probe length 130 mm (5.12 in)

Flow-Through Option
Response time (T90) with > 0.1 l/min 30 s
Flow rate dependence < 1 l/min flow no effect
Flow rate dependence 1 ... 10 l/min flow < 0.6% of reading l/min
Gas flow operating range < 10 l/min
Gas flow recommended range 0.1 ... 0.8 l/min
Inputs and Outputs

Digital output
Over RS-485:
• Modbus
• Vaisala Industrial Protocol

Analog output
• 0 ... 5/10 V (scalable), min load 10 kΩ
• 0/4 ... 20 mA (scalable), max load 500 Ω

Operating voltage
With digital output in use: 12 ... 30 VDC
With voltage output in use: 12 ... 30 VDC
With current output in use: 20 ... 30 VDC

Power consumption
Typical (continuous operation): 0.4 W
Maximum: 0.5 W

When connected to Indigo 200 transmitter
Analog output: 3 voltage (V) or current (mA) outputs:
• 0 ... 10 VDC / 0 ... 5 VDC / 0 ... 1 VDC / 1 ... 5 VDC (min load 1kΩ)
• 0 ... 20 mA / 4 ... 20 mA (max load 500 Ω)

Relays
2 configurable relays

Power supply input
Nominal 24 V, range:
• 15 ... 40 VDC
• 20 ... 28 VAC

Power consumption
Max. 3.5 W (transmitter + probe total max. consumption)

Spare Parts and Accessories

Porous sintered PTFE filter for GMP252
DRW244221SP

Probe cable with open wires (1.5 m)
223263SP

Probe cable with open wires and 90° plug (0.6 m)
244669SP

Probe cable with open wires (10 m)
26546SP

Flow-through adapter with gas ports
ASM21201SP

USB cable for PC connection
24265SP

M70 connection cable for probe
CBL210472

Flat cable for GMP250 probes, M12 5-pinn
CBL210493SP

Probe mounting clips (2 pcs)
243257SP

Probe mounting flange
243261SP

Calibration adapter
DRW244827SP

Spray shield
ASM212017SP

Radiation shield DTR250
DTR250

Radiation shield DTR250 with pole mounting kit
DTR250A

Transmitters
Indigo 200 series
See www.vaisala.com/indigo

1) Vaisala Insight software for Windows available at www.vaisala.com/insight

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